

REMARKS/ARGUMENTS

I. Introduction

Claims 43, 60, and 108 are amended, and claims 110 and 111 are new. Claims 43, 48, 49, 51-57, 59-65, 74-81, and 93-111 are now pending. (Claims 1-42, 44-47, 50, 58, 66-73, and 82-92 were previously canceled.) Applicants respectfully request reconsideration of the application.

II. Rejection

Claims 43, 48, 49, 51-57, 59-65, 74-81, and 93-109 were rejected under 35 USC 102(b) as anticipated by US Patent No. 5,506,515 to Godshalk et al. ("Godshalk"). Applicants respectfully traverse this rejection.

As discussed in previous papers, to be patentable, the product produced by a product-by-process claim (like independent claim 43) must be structurally distinct from prior art products. As also discussed in previous papers, a structural distinction between the tested semiconductor device of claim 43 and prior art semiconductor devices is in the scrub marks on terminals of the semiconductor devices. That is, as discussed at length in previous papers, at least because of the step of "adjusting a planar orientation of probe elements of a probe card assembly to correspond to a planar orientation of said electrical contact terminals" recited in claim 43, the scrub marks on the terminals of the tested semiconductor device produced by the process recited in claim 43 are more uniform across the semiconductor device than the scrub marks on a prior art semiconductor device. As discussed in detail below, because Godshalk does not disclose such a step, the scrub marks on terminals of a semiconductor device produced by Godshalk's process will not be as uniform across the device as the scrub marks on the terminals of the tested semiconductor device of claim 43 of the instant application, and claim 43 is therefore patentable over Godshalk.

Godshalk discloses a system in which the probing ends 31 of a wafer probe apparatus 20 contact pads 106 of a wafer 24 to test dies of the wafer 24. As shown in Figure 2, the wafer is supported by a chuck 26. Presumably because distal ends 118 of fingers 72 that form the probing ends 31 are planarized by lapping or other similar processes (see Godshalk col. 14, lines 23-67), the PTO concluded that the probing ends 31 make marks on the pads 106 of the wafer 24 that are uniform across the wafer.

Godshalk, however, lacks at least the following feature cited in claim 43: "adjusting a planar orientation of probe elements of a probe card assembly to correspond to a planar orientation of said electrical contact terminals by *changing a planar orientation of a probe substrate to which said probe elements are attached with respect to a probe card of said probe card assembly*" (emphasis added). In other words, the probe card assembly recited in claim 43 includes at least two parts: a probe substrate to which the probes are attached, and a probe card. Moreover, the orientation of the first part (the probe substrate) of the probe card assembly can be adjusted with respect to the second part (the probe card) of the probe card assembly. A non-limiting example is shown in Figure 5 in which an orientation of a space transformer 506 (a non-limiting example of the probe substrate recited in claim 43) can be adjusted with respect to a probe card 502 (a non-limiting example of the probe card recited in claim 43).

Godshalk lacks such an ability to adjust an orientation of a substrate to which tip assemblies 28 (see Figure 2 of Godshalk) are attached with respect to any other part of Godshalk's wafer probe apparatus 20. In fact, although the PTO asserted that Godshalk discloses the above-quoted portion of claim 43, the PTO did not identify any portion of Godshalk that discloses such a feature. Because Godshalk lacks the foregoing feature of claim 43, the scrub marks created by probing ends 31 on pads 106 of wafer 24 will necessarily be non-uniform across dies of the wafer 24. The reason is discussed below with reference to Figures A and B below.

In use, Godshalk's wafer probe apparatus 20 would be attached to some sort of housing structure that encloses chuck 26. (See Godshalk Figure 2.) Figure A below is a simplified drawing illustrating this. As shown, wafer probe apparatus 20 is attached to a housing in which chuck 26 is enclosed. Godshalk's wafer 24 is shown disposed on a surface of the chuck 26. Even though Godshalk teaches, as noted above, that distal ends 118 of fingers 72 that form the probing ends 31 of tip assemblies 28 are planarized by lapping or other similar processes, the plane of the probing ends 31 will not coincide exactly with the plane of the contact surface of the pads 106 of wafer 24. As shown in exaggerated fashion in Figure B below, due to manufacturing imperfections in the housing, the chuck 26, and the portion of the housing to which the wafer probe apparatus 20 is attached, the wafer probe apparatus 20 (while attached to the housing) will never be perfectly oriented with the chuck 26. Thus, as shown in exaggerated fashion in Figure B below, the plane of the contact surface of pads 106 will be, due to

manufacturing imperfections, askew of the plane of the probing ends 31 of the tip assemblies 28. Godshalk does not even identify this problem much less provide any mechanism to address it. Consequently, the plane of the probing ends 31 will not coincide with the plane of the contact surface of pads 106 of wafer 24. Consequently, the scrub marks made on pads 106 by probing ends 310 will be non-uniform across dies of the wafer 24 as discussed in previous Amendments.

Figure A

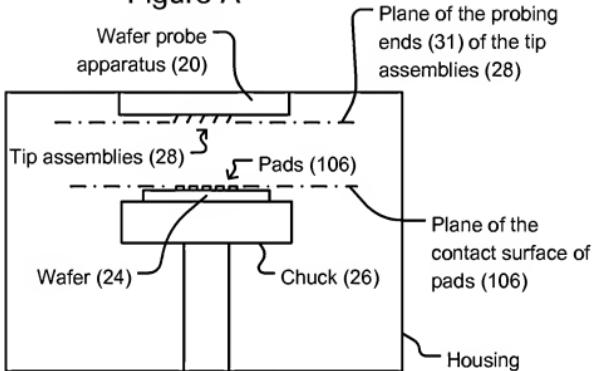
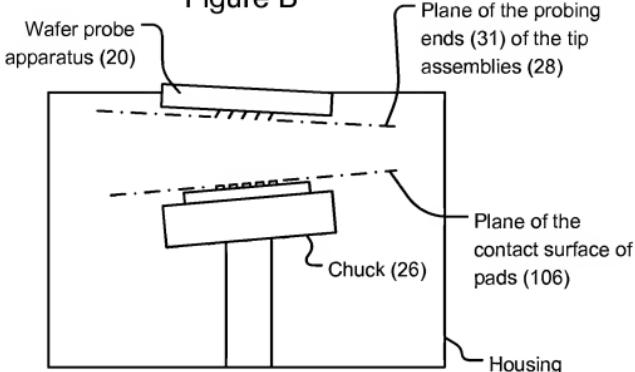
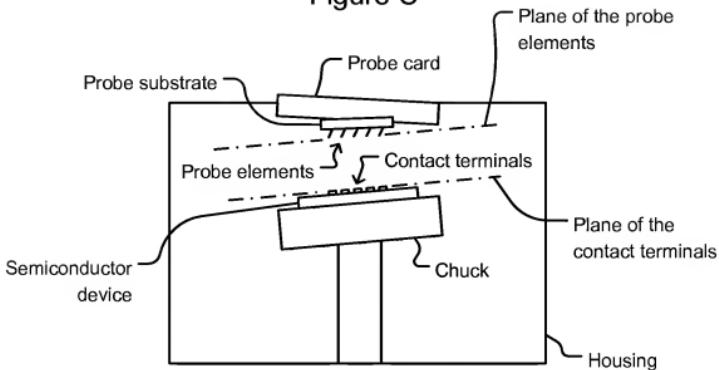


Figure B



In contrast, the feature of "adjusting a planar orientation of probe elements of a probe card assembly to correspond to a planar orientation of said electrical contact terminals by changing a planar orientation of a probe substrate to which said probe elements are attached with respect to a probe card of said probe card assembly" addresses the problem illustrated in Figure B above. Because the foregoing adjusting is of the probe substrate with respect to the probe card, the adjusting can occur while the probe card assembly is attached to a housing. For example, as shown in the non-limiting example in Figure C below, the probe substrate of claim 43 can be adjusted with respect to the probe card so that a plane of the probe elements corresponds to a plane of the contact surfaces of contact terminals of the semiconductor device even if the probe card assembly (comprising the probe card and the probe substrate) and the chuck are askew as generally shown in Figure B above. Generally as discussed in previous Amendments, the resulting scrub marks left on the contact terminals of a semiconductor device will be more uniform across the semiconductor device than the scrub marks left by Godshalk's wafer probe apparatus 20 on pads 106 of wafer 24 (see Godshalk Figure 2).

Figure C



Applicants note that new claims 110 and 111 each recite additional features regarding the adjusting recited in claim 43 and thus further distinguishes over Godshalk.

Applicants also note that all of claims 48, 49, 51-57, 59-65, 74-81, and 93-109 depend from claim 43 and, at least because of that dependency, are also patentable over Godshalk.

Moreover, claims 48, 49, 51-57, 59-65, 74-81, and 93-109 also recite features that give rise to additional distinctions that are patentable over Godshalk.

III. Conclusion

In view of the foregoing, Applicants submit that all of the claims are allowable and the application is in condition for allowance. If at any time the Examiner believes that a discussion with Applicants' attorney would be helpful, the Examiner is invited to contact the undersigned at (801) 426-2106.

Respectfully submitted,

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